Rail Pedestrian Safety Engineering and Design Break out Session

June 22, 2010
Distraction adds to existing challenges:

• Some passengers are in a hurry if they arrive late at the station or wish to get home quickly
• Express trains and freight trains, and trains on a middle track, catch pedestrians unawares if they are expecting a stopping passenger train
• Regular users can be surprised by trains running off schedule
• While Metra express trains have a consistent schedule, this is not true for some Amtrak and freight trains
• Extreme winter weather means that passengers wear clothing that limits their hearing and field of vision
Chicago has a challenging legacy:

- It is one of the largest commuter rail systems in the country
- It is a busy hub for freight trains
- Only the Metra Electric has “high level” platforms
- Inconsistency of left-hand versus right-hand running on some lines confuses infrequent users
- Chicago is on the edge of the prairie with limited natural grade separation
- There is limited constructed grade separation outside of City of Chicago limits except in certain corridors and municipalities
- Station access is from highway-rail grade crossings and mid-station crosswalks
Current design encourages a lax attitude:

• Low level platforms, island platforms, mid-station crosswalks and at-grade stations that parallel surface streets and commercial strips incorrectly signal to pedestrians that the boundary between the “safe” platform and the “dangerous” right of way is somewhat blurred.

• The engineering and design challenge is to take this legacy - which is unlikely to change - and design ways to foster in pedestrians minds that there is a distinct difference between the track and the platform.
There is a tension between engineering solutions versus pedestrian responsibility:

- Some participants felt that it is more cost effective to encourage pedestrians to take more personal vigilance and responsibility for their actions rather than adopt costly and inconvenient engineering solutions
- A completely grade-separated solution would lead to higher fares, increased access times and potential closure of some stations
- Nonetheless, many consumer and industrial products have adopted design solutions to lessen the risks to careless users
Changing travel patterns:

• At one time nearly all travel was destined for Chicago. There was little need for passenger facilities on outbound platforms
• The development of suburb-to-suburb travel has led to substantial numbers of people waiting on outbound platforms
• These platforms often lack shelter from the elements let alone ticket, toilet and refreshment facilities
• Is it little wonder that passengers wait on the inbound side and cross to their platform at the last moment
• Provision of duplicate facilities, even basic facilities, may be the most cost effective engineering initiative
Design of mid-station crosswalks:

• A basic design objective is to make sure that pedestrians turn and reconnoiter in both directions before crossing.

• Fortunately, Chicago is generally blessed with straight tracks and long sight lines.

• Yet many crosswalk are directly in front of station entrances or station houses encouraging people to walk straight ahead without looking.

• Crosswalks can be offset from entrances or buildings and have barrier fences (or chicanes) to make people look in both directions.
Design of mid-station crosswalks:

• Perhaps the surface of the crosswalk or some other design features (embedded LEDs lights?) can indicate to pedestrians that they have moved away from the safety of the platform to a zone where they have to exercise extra caution

• Perhaps we can borrow from Britain and other countries that have been working on design concerns for at-grade “barrow crossings” at the end of platforms

• These countries have also worked on innovative wording and visual signage to warn users, yet does not increase information overload
Design of mid-station crosswalks:

- Some participants suggested design features such as actively pushing a button to open a barrier to focus users attention
- Perhaps very localized jamming devices for electronic or wireless devices can be installed at the crosswalk
- Closing of crosswalks may have the unintended consequences of encouraging “jaywalking” and the cutting and destruction of mid-track fencing
Grade crossings have been designed for vehicles not pedestrians:

- Crosswalks on highways have markings to direct or channel the passage of pedestrians.
- However, highway-rail grade crossings are often bereft of channelization for pedestrians. The sidewalk ends at the crossing and pedestrians proceed seemingly randomly.
- The sidewalk and streetscaping might be designed to separate pedestrians from the traffic stream on an adjacent but separate crossing with pedestrian-appropriate warning devices/barriers installed.
Grade crossings have been designed for vehicles not pedestrians:

• Even at places away from stations, barriers on the pedestrian path can visually and physically dissuade users from taking a 90-degree turn to walk down the right of way.

• Grade crossings adjacent to platforms should be designed so that passengers are not encouraged to cut across the track at an angle, or to enter/exit platforms on the track side of warning devices.

• Metra already has some new designs for platform ends that abut highway-rail crossings.
Other station design considerations:

• Is the location of station car parks and the zoning of local commercial businesses such that passengers are not encouraged to cross the tracks at inappropriate places or access platforms in an unsafe manner?
• Should the platform access points be designed vis-à-vis the neighborhood to discourage passengers from thinking that they can access platforms in a random and casual manner?
With today’s technological we should be able to notify users of non-stop trains:

- With the introduction of positive train control and advances in GPS and wireless technology, it should be straightforward to notify pedestrians and waiting passengers that the next train is x minutes away, and to provide a special warning if an express or freight train that is not stopping is approaching.
Institutional constraints limit progress:

- The division in ownership in many locations between the party that owns the track, the owners of the train and the owners of the station is a challenge.
- Legal design constraints increase the cost and outlaw some low cost but effective solutions.
- The fear of lawsuits promotes a culture of doing nothing as opposed to doing something which may be a great improvement but is not guaranteed to be 100% effective.
Trespassing is a perpetual problem:

- The role of engineering in preventing trespass is complex
- Effective prevention of trespass should be informed by knowledge of the motivation for trespass at specific locations
- More fencing at specific places can deter those taking a well-known shortcut, but in other places could serve to provide more “privacy” for those loitering near the tracks to rest or engage in illicit activities
- Clearance of vegetation and other obstructions to clear vision can remove the attraction of the railroad right of way to some trespassers
Suicides are prevalent and hard to prevent:

• Experience in Britain is that erecting strong and continuous fencing has relocated suicides from plain track to grade crossings and station platforms.

• There is a literature and researchers (primarily in Montreal) that study how station design can reduce the incidence of suicide.

• There is evidence that prompt intervention and referral to health care professionals can prevent suicides.
High speed trains may change the game:

• If high speed trains are expected to run at their potential speed within the built-up area rather than decelerating well before they reach Chicago, it seems likely that commuter stations will have to redesigned with high level platforms and pedestrian bridges or underpasses.

• This will confer advantages on corridors that already have high level platforms and grade separation (such as the former Illinois Central main line).